Protect Children, Fire Fighters, and the Great Lakes

Limit Toxic Flame-Retardants



Fighting fires does not have to have toxic consequences. PBDEs, flame-retardants that are rapidly accumulating in our bodies and the Great Lakes, have been found to be toxic to animals and may threaten our own health. Safe, affordable alternatives are available. Support HB 4699 to phase out deca-BDE in mattresses, residential furniture, televisions, and computers.

ARE TOXIC FLAME-RETARDANTS THE NEXT PCBs?

- PBDEs polybrominated diphenyl ethers, commonly used as flame-retardants – are added to textiles, foam products, and plastics to make them difficult to burn.^{1,2} There are three commercial forms of PBDEs: penta-BDE, octa-BDE, and deca-BDE. Deca-BDE is often added to drapes, carpets, furniture upholstery, and the plastic casings of electronics.^{3,4}
- In 2004, the Michigan Legislature banned manufacturing, processing and distribution of materials containing more than 0.1% penta-BDE or octa-BDE.⁵ However, under certain circumstances, deca can break down into more toxic forms of PBDEs, including the banned octa-BDE.^{6,7,8,9,10}
- Deca continues to be used heavily in the United States. Over 40% of all deca produced worldwide is used in North America.
- PBDEs are structurally very similar to PCBs, chemicals once favored by industry but ultimately banned in the 1970s because of their high toxicity. Like PCBs, PBDEs are extremely persistent in the environment and can accumulate in the fatty tissues of living organisms.¹²

TOXIC LEVELS ARE RISING

- PBDE levels "in human tissues in North America have increased significantly over time, and are much higher compared to levels in Europe or Japan."¹³
- Limited studies indicate that children accumulate higher levels of PBDEs than adults.¹⁴
- Lake Michigan salmon were found to contain PBDEs at levels above 100 parts per billion,

- "one of the world's highest concentrations for salmon in open water." PBDE levels in Great Lakes walleye and lake trout rose exponentially from 1980 to 2000, doubling every 3-4 years. 16
- Workers who recycle, repair, and maintain computers have comparatively high levels of PBDEs.¹⁷
- In the U.S., PBDEs have been found in the breast milk of women at levels 10 to 100 times higher than those found in Europe.^{18,19}

HEALTH IMPACTS

- <u>Learning and Memory</u>: Exposure to deca-BDE in mice and rats during brain development "can give rise to irreversible changes in adult brain function."²⁰
- <u>Reproductive</u>: Rats exposed to PBDEs experienced a **delayed onset of puberty** and reproductive development.²¹
- <u>Cancer</u>: Rodents who ate deca-BDE developed liver tumors, causing the U.S. Environmental Protection Agency to classify deca as a "possible human carcinogen."²²
- <u>Thyroid</u>: PBDEs can disrupt homeostatic thyroid levels in mice.²³ Decreased concentrations of the thyroid hormone can lead to **decreased IQ** in offspring.²⁴

FIRE ORGANIZATIONS SUPPORT BANNING PBDEs

 The Michigan Association of Fire Chiefs supports phasing out PBDEs because they "have been identified as having adverse physiological and development impacts on humans," "there are readily available substitute products that do not exhibit these effects," and "when PBDE compounds are exposed to fire they burn and release dense fumes and a highly corrosive gas know as hydrogen bromide which expose firefighters to additional chemical hazards."²⁵

· The International Association of Fire Fighters (IAFF) supports banning brominated flame retardants as "a step in the right direction for improving the health and safety of our fire fighters." IAFF states: "Many studies involving fire fighters exposed to these and other toxic gases during active fire fighting, overhaul, and long term exposure from these chemicals penetrating gear, have found that fire fighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases. While we support the concept of flame retardant chemicals, there are alternatives that do not contain bromine or chlorine and are much safer for fire fighters than PBDEs."26,27

SAFER ALTERNATIVES ARE WIDELY USED

- Many electronics companies already or will soon meet fire safety standards without using deca-BDE including Dell, HP, Toshiba, Apple, Sony, Panasonic, Phillips, and Samsung.²⁸
- Mattress companies Sealy, Simmons, and Serta do not use deca-BDE in their products. IKEA sells only PBDE-free office furniture.²⁹
- Michigan-based La-Z-Boy Incorporated³⁰ and Steelcase Furniture³¹ do not use deca-BDE in their products.
- Michigan-based Herman Miller states that deca-BDE is an "unhealthy/dangerous fire retardant chemical and one that is definitely not used in our product offering." Their reasoning includes that deca-BDE "has been traced in animals like polar bears, fish" and "has appeared in mother's breast milk."³²

BANS GAINING MOMENTUM

 Michigan and nine other states already regulate the use of penta-BDE and octa-BDE.³³ Industries voluntarily withdrew the manufacture of penta-BDE by 2005 because of

- evidence that the chemical may be toxic and traces were found in breast milk.³⁴
- Washington State and Maine recently banned deca for many uses.³⁵
- The Michigan Interdepartmental Toxics Steering Group recommends "legislation banning Deca-BDE...contingent on the availability of a safe alternative." 36

Health, medical, and environmental organizations that support HB 4699 (partial list):

American Academy of Pediatrics (Michigan Chapter)
Arab Community Center for Economic and Social
Services (ACCESS)

Association for Children's Mental Health

Autism Society of Michigan

Citizens for Alternatives to Chemical Contamination

Clean Water Action

Clean Water Fund

Clinton County Family Resource Center

Detroiters Working for Environmental Justice

East Michigan Environmental Action Council (EMEAC)

Ecology Center

Environment Michigan

Healthy Homes Coalition of West Michigan

Learning Disabilities Association of Michigan

Local Motion

Michigan Chapter of the National Association of Pediatric Nurse Practitioners

Michigan Coalition for Children and Families

Michigan Environmental Council

MI League of Conservation Voters Education Fund

Michigan Nurses Association

Science and Environmental Health Network

Voices for Earth Justice

MICHIGAN LEGISLATORS CAN PROTECT CHILDREN, FIRE FIGHTERS AND OUR GREAT LAKES FROM DECA-BDE!

Support HB 4699 to phase out deca-BDE in mattresses, residential furniture, televisions, and computers.³⁷

Bolding added by the Michigan Network for Children's Environmental Health.

References:

- Agency for Toxic Substances and Disease Registry (ATSDR). ToxFAQs. Polybrominated Diphenyl Ethers (PBDEs). September 2004. http://www.atsdr.cdc.gov/tfacts68-pbde.html. Accessed January 9, 2008.
- Illinois Environmental Protection Agency. DecaBDE Study: A Review of the Available Research. A Report to the General Assembly and the Governor In Response to Public Act 94-100. January 2006. Pp 9. http://www.epa.state.il.us/reports/decabde-study/available-research-review.pdf. Accessed January 9, 2008.
- ³ Illinois Environmental Protection Agency. DecaBDE Study: A Review of the Available Research. A Report to the General Assembly and the Governor In Response to Public Act 94-100. January 2006. Pp 9. http://www.epa.state.il.us/reports/decabde-study/available-research-review.pdf. Accessed January 9, 2008.
- Wilford BH Shoeib M Harner T et al. Polybrominated Diphenyl Ethers in Indoor Dust in Ottawa, Canada: Implications for Sources and Exposure. Environmental Science & Technology. 2005. Volume 39. Pp 7027-7035.
- Michigan legislature webpage on SB 1458 and HB 4406. http://www.legislature.mi.gov/ (S(aegvq255qicqbb45zaex3g45))/mileg, aspx?page=getObject&objectName=2004-SB-1458 and http://www.legislature.mi.gov/ (S(aegvq255qicqbb45zaex3g45))/mileg.aspx?page=getObject&objectName=2003-HB-4406.
- ⁶ Ahn M Filley TR Jafvert Ct et al. Photodegradation of decabromodiphenyl ether adsorbed onto clay minerals, metal oxides, and sediment. Environmental Science & Technology. 2006. Volume 40. Number 1.

- Pp 215-220. http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2006/40/i01/abs/es051415t.html. Accessed January 9, 2008.
- Joderstrom G Sellstrom U de Wit CA et al. Photolytic Debromination of Decabromodiphenyl Ether (BDE 209). Environmental Science & Technology. 2004, 38, Pp 127-132.
- Eriksson J Green N Maarsh G et al. Photochemical Decomposition of 15 Polybrominated Diphenyl Ether Congeners in Mathanol/Water. Environmental Science & Technology, 38, Pp 3119-3125, 2004.
- ⁹ He J Robrock KR Alvarez-Cohen L. Microbial Reductive Debromination of Polybrominated Diphenyl Ethers (PBDEs). Environmental Science & Technology, 2006, 40, Pp 4429-4434.
- Wilford BH Shoeib M Harner T et al. Polybrominated Diphenyl Ethers in Indoor Dust in Ottawa, Canada: Implications for Sources and Exposure. Environmental Science & Technology. 2005. Volume 39. Pp 7027-7035.
- Illinois Environmental Protection Agency. DecaBDE Study: A Review of the Available Research. A Report to the General Assembly and the Governor In Response to Public Act 94-100. January 2006. Pp 2. http://www.epa.state.il.us/reports/decabde-study/available-research-review.pdf. Accessed January 9, 2008.
- ¹² Bragigand V. Amiard-Triquet C. Parlier E. et al. Influence of Biological Factors on the Bioaccumulation of Polybrominated Diphenyl Ethers in Aquatic Food Webs from French Estuaries. Science of the Total Environment. Volume 368. Pp 615-626. 2006.
- ¹³ Michigan Interdepartmental Toxics Steering Group. "Polybrominated Diphenyl Ethers: A Scientific Review with Risk Characterization and Recommendations." May 2008. http://www.michigan.gov/documents/deq/deq-tox-PBDEBackground Paper-5-08 243976 7.pdf. Accessed September 18, 2008.
- ¹⁴ Fischer D Hooper K Athanasiadou M et al. Children Show Highest Levels of Polybrominated Diphenyl Ethers in a California Family of Four: A Case Study. Environmental Health Perspectives. 2006. Volume 114. Pp 1581-1584. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1626410. Accessed January 9, 2008.
- ¹⁵ Fields, Scott. Great Lakes Resource at Risk. Environmental Health Perspectives. Volume 113. Number 3. March 2005. Pp. A164-A173. http://www.ehponline.org/docs/2005/113-3/toc.html. Accessed January 18, 2008.

- Thu L Hites RA. Temporal Trends and Spatial Distributions of Brominated Flame Retardants in Archived Fishes from the Great Lakes. Environmental Science Technology. 2004. Volume 38. Number 10. Pp. 2779-2784. http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2004/38/i10/abs/es035288h.html. Accessed January 9, 2008.
- ¹⁷ Sjodin A Hagmar L Klasson-Wehler E. Flame Retardant Exposure: Polybrominated Diphenyl Ethers in Blood from Swedish Workers. Environmental Health Perspectives. Volume 107. Number 8. August 1999. Pp 643-648. http://www.ehponline.org/members/1999/107p643-648sjodin/sjodin-full.html. Accessed January 16, 2008.
- ¹⁸ Viberg H Mundy W Eriksson P. Neonatal exposure to decabrominated diphenyl ether (PBDE 209) results in changes in BDNF, CaMKII and GAP-43, biochemical substrates of neuronal survival, growth, and synaptogenesis. NeuroToxicology Volume 29, Issue 1, January 2008, Pages 152-159.
- ¹⁹ Schecter A Pavuk M Papke O et al. Polybrominated Diphenyl Ethers (PBDEs) in U.S. Mothers' Milk. Environmental Health Perspectives Volume 111, Number 14, November 2003.
- Viberg H Fredriksson A Jakobsson E et al. Neurobehavioral Derangements in Adult Mice Receiving Decabrominated Diphenyl Ether (PBDE 209) during a Defined Period of Neonatal Brain Development. Toxicological Sciences. 2003. Volume 76. Pp 119 (Print 8). http://toxsci.oxfordjournals.org/cgi/reprint/76/1/112. Accessed January 16, 2008.
- ²¹ Birnbaum L. Staskal D. Brominated Flame Retardants: Cause for Concern? Environmental Health Perspectives. Volume 112. Number 1. January 2004. (Print Pp 14). http://www.ehponline.org/members/2003/6559/6559.pdf. Accessed January 16, 2008.
- ²² Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs. Polybrominated Diphenyl Ethers (PBDEs). September 2004. http://www.atsdr.cdc.gov/tfacts68-pbde.html. Accessed January 16, 2008.
- ²³ Zhou T Taylor MM DeVito MJ et al. Developmental Exposure to Brominated Diphenyl Ethers Results in Thyroid Hormone Disruption. Toxicological Sciences. Volume 66. Page 105. 2002. http://toxsci.oxfordjournals.org/cgi/reprint/66/1/105. Accessed January 16, 2008.
- ²⁴ Birnbaum L. Staskal D. Brominated Flame Retardants: Cause for Concern? Environmental Health Perspectives. Volume 112. Number 1. January 2004. (Print Pp 14). http://www.ehponline.org/members/2003/6559/6559.pdf. Accessed July 27, 2007.
- ²⁵ Michigan Association of Fire Chiefs Position Statement on Michigan House Bill 4465.

- ²⁶ Letter from Richard Duffy, Assistant to the General President of the International Association of Fire Fighters (IAFF), to Kelly Fox, President of the Washington State Council of Fire Fighters, on behalf of IAFF. January 26, 2007.
- ²⁷ Letter from Richard Duffy, Assistant to the General President of the International Association of Fire Fighters (IAFF), to Matthew Vinci, President, Professional Fire Fighters of Vermont. March 23, 2009.
- ²⁸ Clean Production Action. DecaBDE and BFR Substitution in the Electronics Industry: Leading Manufacturers are Moving Away from Bromine Chemistry in Computers and Televisions. November 2006. http://www.safer-products.org/downloads/Electronics%20BFR%20Fact%20Sheet.pdf. Accessed January 16, 2008.
- ²⁹ Greiner T. Alternatives to DecaBDE in Electronics and Textile Products. Pure Strategies, Inc. 2005.
- ³⁰ E-mail from La-Z-Boy customer service, La-Z-Boy Incorporated, to consumer David Woods, regarding inquiry number #244535. January 30, 2008.
- ³¹ E-mail from Mary Underwood, Seating Marketing for Steelcase, to Laura Rusello. February 8, 2008.
- ³² E-mail from Betty Lemmen, Compliance Program Mgr. at Herman Miller Inc., to Diane Sherman. February 20, 2008.
- ³³ Michigan Interdepartmental Toxics Steering Group. "Polybrominated Diphenyl Ethers: A Scientific Review with Risk Characterization and Recommendations." May 2008. http://www.michigan.gov/documents/deq/deq-tox-PBDEBackground Paper-5-08 243976 7.pdf. Accessed September 18, 2008.
- ³⁴ Environmental Working Group. Body Burden -The Pollution in Newborns. July 14, 2005. Pp 46. http://archive.ewg.org/reports/bodyburden2/pdf/bodyburden2 final-r2.pdf. Accessed January 16, 2008.
- ³⁵ Michigan Interdepartmental Toxics Steering Group. "Polybrominated Diphenyl Ethers: A Scientific Review with Risk Characterization and Recommendations." May 2008. http://www.michigan.gov/documents/deq/deq-tox-PBDEBackground-Paper-5-08-243976-7.pdf. Accessed September 18, 2008.
- ³⁶ Michigan Interdepartmental Toxics Steering Group. "Polybrominated Diphenyl Ethers: A Scientific Review with Risk Characterization and Recommendations." May 2008. http://www.michigan.gov/documents/deq/deq-tox-PBDEBackground Paper-5-08 243976 7.pdf. Accessed September 18, 2008.
- ³⁷ Michigan Legislature webpage on HB 4465: http://www.legislature.mi.gov/(S(ftraf4usdr5k1j55u0le4c45))/mileg.aspx?page=getObject&objectName=2007-HB-4465. Accessed January 16, 2008.

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The Michigan Network for Children's Environmental Health is a coalition of health professionals, health-affected groups, environmental organizations, and others dedicated to a safe and less toxic world for Michigan's children. Through education, outreach, and advocacy, we seek to protect Michigan's children from adverse impacts caused by exposure to widespread hazardous chemicals.

For more information, contact Gen Howe, MPH, Environmental Health Campaign Director, at 734-761-3186 ext. 115 or Mike Shriberg, Ph.D., Policy Director, at 734-761-3186 ext. 108.

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Excerpts from the

Michigan Interdepartmental Toxics Steering Group Report on PBDEs

(Polybrominated Diphenyl Ethers)



The following statements are excerpted from "Polybrominated Diphenyl Ethers: A Scientific Review with Risk Characterization and Recommendations," a May 2008 report from the state's Interdepartmental Toxics Steering Group. The full report is available at www.michigan.gov/documents/deq/deq-tox-PBDEBackground_Paper-5-08_243976_7.pdf.

"The first recommendation is to support a legislative ban on Deca-BDE contingent on the availability of a safe alternative."*
- p. xv

"PBDEs are of significant environmental concern because they are **toxic**, **bioaccumulative and persistent**. Levels in humans and wildlife are **increasing exponentially**."
- p. x

"While there are many uncertainties associated with quantifying risk from environmental exposure to Deca-BDE, the available data suggest reason for concern and support action to limit uses and move to safer alternatives."

- p. 89

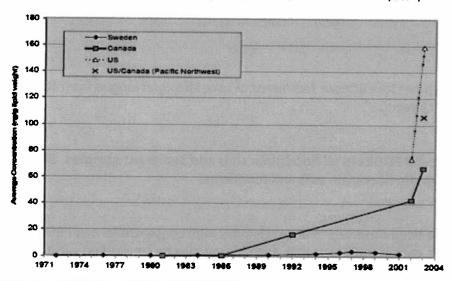
PBDE Levels Rapidly Rising in People

"Temporal trends of **PBDEs in human tissues** show levels in North America are increasing significantly over time ... PBDE levels **in breast milk** also show similar increases over time and appear to be **doubling every 2-5 years in North America** (Betts, 2002)."

- p. xii

Figure 6: Trends of PBDEs in Human Milk for Sweden, Canada, and the United States

(Data from Meironyte et al., 1999; Ryan et al., 2002; Guvenius et al., 2003; Schecter et al., 2003; EWG, 2003; Northwest Environmental Watch, 2004)



"Data on concentrations of PBDEs in human blood, breast milk, and adipose tissue have consistently shown levels to be significantly higher in North America, compared to Europe or Japan. Levels found in the United States (U.S.) are the highest of all countries for which there are data and are about ten to 100 times greater than human tissue levels in Europe."

<u>PBDEs Rapidly Increasing in Michigan's Environment and in the Great Lakes</u> "PBDEs have been found in ambient air, lakes, rivers, soils, and sediments as well as the indoor environment."

- p. xiii

- p. xii

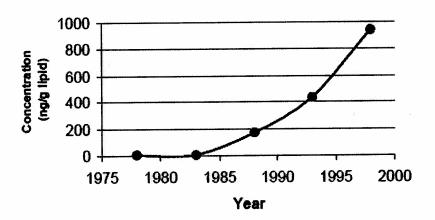
"The sum of these PBDE congeners **increased exponentially in all the Great Lakes** from 1980 to 2000, with doubling times ranging between 3-4 years."

- p. 50

"Herring gull eggs from the Great Lakes region analyzed by the Canadian government showed a **60-fold increase during the past two decades with no significant signs of downward trends** (Moisey et al., 2001, as cited in de Wit, 2002)."

- p. 50

Figure 4: Total PBDE Concentrations in Whole Lake Trout from Lake Ontario Between 1978 and 1998 (Luross et al., 2000)



"Estimated doubling times for PBDEs in sediments of Lake Michigan ranged from 10-13 years, and in Lake Huron from 10-12 years..."

- p. 66

"The MDEQ (2006), found PBDEs in all floodplain soils and sediment samples. Deca-BDE was the predominant congener in floodplain soils and sediments."

- p. 66

"Great Lakes fish have been observed to have relatively high concentrations of PBDEs compared to other foods. However, concentrations in milk and chicken may be considered substantial, given the total quantities of these items consumed by the public."

- p. xii

Increasing Evidence of Health Risks

"Some PBDE congeners exhibit toxicity similar to dioxins."

- p. xi

"Exposure of laboratory animals to PBDEs has resulted in histopathological changes to the liver, neurodevelopmental effects in developing animals, and/or reductions in thyroid hormone levels." - p. xi

"Since PBDEs have structures **similar to** other halogenated aromatic contaminants, such as polychlorinated biphenyls (**PCBs**) **and dioxin**, it has been proposed that they may have a similar mechanism of action."

- p. 20

Children at Highest Risk

"Household dust has been shown to contain high concentrations of PBDEs and typically, Deca-BDE is the most abundant congener. Household dust may be a significant exposure pathway. This is a concern since children ingest a greater amount of house dust than adults due to their frequent hand-to-mouth activity."

- p. 90

Deca Breaks Down to More Toxic Chemicals Like the Banned PBDEs

"Evidence is available which demonstrates that Deca-BDE debrominates to the more toxic PBDE congeners."

- p. 90

"The effects of exposure to multiple PBDE congeners potentially are additive. If the effects are additive, the risks could be significantly greater than those related only to Deca-BDE."
- p. 90

Deca is Produced in the U.S. Only in Arkansas

"In the U.S., **PBDEs are only produced in Arkansas** at the Albemarle Corporation (Magnolia, AK) and at the Great Lakes Chemical Corporation (Eldorado, AK) (ATSDR, 2004)."

- p. 18

* Editorial Notes: The state Interdepartmental Toxics Steering Group did not analyze the safer alternatives but analysis by other states and researchers confirm their availability and widespread use for all products in HB 4699.

(Bold in the excerpts was added by the Michigan Network for Children's Environmental Health.)

Organization Members: American Academy of Pediatrics (Michigan Chapter), Arab Community Center for Economic and Social Services (ACCESS), Association for Children's Mental Health, Autism Society of Michigan, Citizens for Alternatives to Chemical Contamination, Clean Water Fund, Clinton County Family Resource Center, Detroiters Working for Environmental Justice, East Michigan Environmental Action Council, Ecology Center, Healthy Homes Coalition of West Michigan, Learning Disabilities Association (LDA) of Michigan, Local Motion, Michigan Chapter of the National Association of Pediatric Nurse Practitioners, Michigan Coalition for Children and Families, Michigan Environmental Council, Michigan League of Conservation Voters Education Fund, Michigan Nurses Association, Science and Environmental Health Network, Voices for Earth Justice.

Our Mission: Through education, outreach, and advocacy, we seek to protect Michigan's children from adverse impacts caused by exposure to widespread hazardous chemicals.

For more information, contact Mike Shriberg, Ph.D., Ecology Center Policy Director, at 734-761-3186 ext. 108 or Gen Howe, MPH, Environmental Health Campaign Director, at 734-761-3186 ext. 115.

Michigan Network for Children's Environmental Health

— A Brief Overview

Who We Are

• We are a coalition of health professionals, health-affected groups, environmental organizations, and others dedicated to a safe and less toxic world for Michigan's children.

Our Mission

 Through education, outreach, and advocacy, we seek to protect Michigan's children from adverse impacts caused by exposure to widespread hazardous chemicals.

What We Do

- Advocate for policy changes to reduce threats to children's health.
- Educate health professionals and the general public.
- Build the case for broad reform of chemicals regulation to protect Michigan's children.

2009/2010 Priorities

- Protect children's health by urging Michigan legislators to:
 - Protect children from toxic chemicals in toys and other consumer products by giving consumers the right to know what's in products.
 - Restrict pharmaceutical use of the pesticide lindane.
 - Phase out most uses of deca-BDE, a toxic flame retardant that is accumulating in the Great Lakes and in our bodies.
 - Reduce sources of air quality degradation that lead to asthma, such as smoking and diesel emissions..
- Grow Michigan-based green jobs through Green Chemistry and the development of safer alternatives to hazardous chemicals.









Michigan Network for CHILDREN'S Environmental H E A L T H

MEMBER ORGANIZATIONS

- American Academy of Pediatrics (Michigan Chapter)
- Arab Community Center for Economic and Social Services (ACCESS)
- Association for Children's Mental Health
- Autism Society of Michigan
- Citizens for Alternatives to Chemical Contamination
- · Clean Water Fund
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- · Michigan Nurses Association
- Science and Environmental Health Network
- Voices for Earth Justice

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JOIN THE NETWORK

For more information, contact: Genevieve Howe at: 734-761-3186 x 115 or gen@ecocenter.org, or Mike Shriberg at: 734-761-3186 x108 or

To stay informed: Sign up online at: www.mnceh.org!

Leading Companies Not Using Deca-BDE



Alternatives to Deca-BDE are being widely used by industry in the production of mattresses, residential furniture, televisions, and computers (the products addressed by HB 4699). Companies are meeting fire safety standards while not using deca-BDE by resdesigning products, or by using alternative flame retardants. Support HB 4699!

Companies that DO NOT USE DECA-BDE

TVs/Computers/Electronics¹

Apple

Dell

DSM Engineering Plastics

Hewlett Packard

Lenovo

LG Electronics

Nanya/Indium

Panasonic

Philips

Samsung

Seagate Technology, Inc.

Sharp

Silicon Storage Technology, Inc.

Sony

Sony-Ericsson

Toshiba

Furniture²

Herman Miller

IKEA

La-Z-boy

Steelcase

Note: Many furniture manufacturers do not disclose deca content.

Mattresses³

THESE ARE 14 OF THE TOP 15 BEDDING MANUFACTURERS IN THE U.S. MARKET:

Corsicana

Englander

International Bedding Corp

King Koil

Kingsdown

Lady Americana

Restonic

Sealy

Select Comfort

Serta

Simmons

Spring Air (none applied at assembly

factory)

Tempur-Pedic

Therapedic (none applied at assembly factory)

^{1.} Sources: a) Clean Production Action, Progress Towards PVC and BFR Elimination by Leading Electronic Manufacturers Selling Products in the U.S., Feb 2008. b) ChemSec, CPA, Greening Consumer Electronics, Sep 2009

^{2.} Sources: a) Clean Production Action for IKEA. b) Personal Communications for La-Z-Boy, Herman Miller & Steelcase

^{3.} Source: Mattresses and Deca-BDE, Washington Department of Ecology, Sep 12, 2006

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Safer Alternatives to Deca

Achieving Fire Safety Without Toxic Chemicals

...We did not see any evidence that flame retardants being used as alternatives to decaBDE do not meet all required fire safety standards. - Illinois Environmental Protection Agency

HB 4699 would limit the use of Deca only in the following products:

• TVs

Computers

· Residential Upholstered furniture

Mattresses

Current Uses of Deca

Approximately 80% of Deca used in the United States is in electronics, with the vast majority used in the plastic casings of televisions. The use of Deca in computer monitors is extremely rare. According to Washington State, 95% of computer products are Deca-free.ⁱⁱ

Textiles comprise the second largest use of Deca in the country. However, the chemical is not currently typically used in residential upholstered furniture and "furniture industry sources suggest that, in 99% of cases, chemical flame retardants will not be needed to meet pending national standards for residential upholstered furniture."

With regard to mattresses, Deca was previously used by manufacturers. However, the industry has made a shift. "The International Sleep Products Association (ISPA), a trade association representing mattress manufacturers, reports that all its members use fire-resistant barriers that minimize the need for flame retardant chemicals." In addition, manufacturers have uniformly avoided the use of Deca to meet a national flammability standard that took effect in July 2007.

Current Uses of Deca					
Plastic housing of TVs	Vast majority				
Plastic housing of computers	Very rare				
Residential upholstered furniture	Not used				
Mattresses or mattress pads	Industry shift away from Deca				

Fire Safety Standards for TVs

Underwriters Laboratory (UL) sets fire safety standards for TVs sold in the United States.

The UL standard for TV enclosures requires the UL94 V-0 rating for any plastic within two inches of an ignition source.

This is a vertical burn test where five vertically mounted samples of plastic are exposed to two consecutive ten-second ignitions from an open flame. The UL 94 V-0 rating, one of the most stringent, means that:

- The extinguishment time for each sample does not exceed 10 seconds
- The total combustion time for all five samples does not exceed 50 seconds
- The afterglow time per sample does not exceed 30 seconds
- · There were no flaming drips
- No burning occurred up to the holding clamps

Deca-free TVs that meet the UL94 V-0 standard are already on the market.

95% of Computers are already Deca-free

Source: Washington State DEP. Washington State Polybrominated Diphenyl Ether (PBDE) Chemical Action Plan: Final Plan. January 2006.

Meeting Fire Safety Standards

Fire safety standards for televisions, computers, furniture, and mattresses can be achieved without Deca by using non-chemical and chemical substitutes.

Non-chemical alternatives to Deca can include the redesign of a product or the use of materials that are inherently more flame resistant. For example, in electronic equipment, metal components could be used to protect the power supply. And with textiles, easily ignitable fabrics could be replaced with materials that are difficult to ignite or burn more slowly (such as wool).

Fire safety standards can also be met by using chemical alternatives to Deca. For example, a phosphorous-based compound called resorcinol bis (diphenyl phosphate) (RDP) is a common substitute for Deca in electronics. According to the Maine Department of Environmental Protection and the Maine Center for Disease Control and Prevention, "RDP presents a significantly lower threat to the environment and human health than decaBDE."

Affordable Alternatives

Alternatives to Deca are not only available, but are cost effective. According to reports written by the states of Illinois, Maine, and Minnesota, there are affordable alternatives to Deca for consumer electronics, residential upholstered furniture, and mattresses.

In fact, many of these alternatives are already being used in the marketplace. For instance, Washington State estimates that roughly 57% of televisions and 95% of computer products do not contain Deca. VII And as noted above, mattress manufacturers have already shifted away from the use of Deca.

Many electronics manufacturers have already removed Deca from their products including:

- Sony Apple LG Electronics
- Sharp
 Dell
- Toshiba Personal Computing
- · Samsung · Lenovo · Hewlett Packard
- · Panasonic · Phillips

Source: Clean Production Action. Progress Towards PVC and BFR Elimination by Leading Electronic Manufacturers Selling Products in the US, February 2008.

Sealy	• Kingsdown	• Simmons	• Englander
• Serta	• International Bedding Corp	• Tempur-Pedic	• Restonic
• Select Comfort	Corsicana	King Koil	• Lady American
	Corsicana for Children's Environmental Health. Leading Comp		

For all applications in which decaBDE currently is used, alternatives without decaBDE are available...No applications were identified in which decaBDE is the only flame retardant used or in which decaBDE offers unique or exceptional properties. No application was identified in which the use of alternatives requires a compromise in fire safety. Viii

-- Maine Department of Environmental Protection & Maine Center for Disease Control and Prevention

(The information in this factsheet was compiled by Vermont PIRG)

¹ Illinois Environmental Protection Agency, Report on Alternatives to the Flame Retardant DecaBDE: Evaluation of Toxicity, Availability, Affordability, and Fire Safety Issues (Appendix I, p.16), March 2007.

ii Washington State DEP. Washington State Polybrominated Diphenyl Ether (PBDE) Chemical Action Plan: Final Plan (p.65). January 2006.

Maine Department of Environmental Protection and Maine Center for Disease Control and Prevention, *Brominated Flame Retardants: Third Annual Report to the Maine Legislature* (p.25-26, 35), January 2007.

^{iv} Maine Department of Environmental Protection and Maine Center for Disease Control and Prevention, *Brominated Flame Retardants:* Third Annual Report to the Maine Legislature (p.26, 35), January 2007.

^v The Lowell Center for Sustainable Production, University of Massachusetts Lowell, *Decabromodiphenylether: An Investigation of Non-Halogen Substitutes in Electronic Enclosure and Textile Applications* (p.35), April 2005.

vi Maine Department of Environmental Protection and Maine Center for Disease Control and Prevention, *Brominated Flame Retardants: Third Annual Report to the Maine Legislature* (executive summary), January 2007.

vii Washington State DEP. Washington State Polybrominated Diphenyl Ether (PBDE) Chemical Action Plan: Final Plan (p.65). January 2006.

Maine Department of Environmental Protection and Maine Center for Disease Control and Prevention, *Brominated Flame* Retardants: Third Annual Report to the Maine Legislature (p.36), January 2007.

Fire Fighter Organizations across the U.S. Support Banning or Restricting Toxic Flame-Retardant Deca-BDE



Fire Fighters and their professional organizations across the country have expressed their support for restricting the use of deca-BDE (decabrominated diphenyl ether), a flame retardant commonly used in consumer products, which would be restricted by HB 4699. Fire fighters have expressed concerns about their occupational exposures when deca burns, particularly given the widespread use of cost-effective alternatives that can help prevent fires. Eleven states, including Michigan, have banned or restricted the only other polybrominated diphenyl ethers (PBDEs) that were in commercial use, penta- and octa-BDE, and these compounds have now been withdrawn by industry throughout the U.S. Four states have already banned or restricted deca-BDE.

INTERNATIONAL International Assocation of Fire Fighters (IAFF)

"Our union is concerned about the health and safety of our members as well as the health and safety of all of our citizens.
 Accordingly, the IAFF believes that the passage of legislation banning brominated flame retardants (Polybrominated diphenyl ethers (PBDEs) including Penta-, Octa-, and Deca-BDEs) is a step in the right direction for improving the health and safety of our firefighters and the citizens who are exposed to these chemicals."

Source: Letter from Richard M. Duffy, Assistant to the General President, Occupational Health, Safety, and Medicine, IAFF, to Matthew Vinci, President, Professional Fire Fighters of Vermont, March 23, 2009.

- "Unlike other flame retardants, when PBDEs burn, they release dense fumes and black smoke that reduce visibility and a highly corrosive gas known as hydrogen bromide. In addition, PBDEs produce highly toxic byproducts of incomplete combustion. Although use of flame retardants saves lives and property, there have been unintended consequences. There is evidence that PBDEs persist in the environment and accumulate in living organisms, as well as toxicological testing that indicates these chemicals may cause liver toxicity, thyroid toxicity, and neurodevelopmental toxicity."
- "Many studies involving fire fighters exposed to these and other toxic gases during active

fire fighting, overhaul, and long term exposure from these chemicals penetrating protective gear, have found that fire fighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases. While we support the concept of flame retardant chemicals, there are alternatives that do not contain bromine or chlorine and are much safer for fire fighters than PBDEs."

Source: Letter from Richard M. Duffy, Assistant to the General President, Occupational Health, Safety, and Medicine, IAFF, to Kelly Fox, President, Washington State Council of Fire Fighters, January 26, 2007.

MICHIGAN

Michigan Association of Fire Chiefs

- "The Executive Board of the Michigan Association of Fire Chiefs has passed a resolution supporting House Bill 4699, a bill banning DECA-BDE."
- "Deca-BDE and its family of flame retardant chemicals known as polybrominated diphenyl ether (PBDE) have been identified as having adverse physiological and developmental impact on humans."
- "When PBDE compounds are exposed to fire they burn and release dense fumes and a highly corrosive gas known as hydrogen bromide which exposes firefighters to additional chemical hazards."

Source: Letter from David Peterson, President, Michigan Association of Fire Chiefs, to Michigan State Representative Deborah Kennedy, May 29, 2009.

ILLINOIS

Associated Fire Fighters of Illinois Illinois Fire Fighters Association

- "Our organizations are concerned with ensuring public health and safety, preventing fires by maintaining high fire safety standards, and protecting our firefighters from harm in their working environments. We support the phase-out [of] PBDEs—including penta-, octa-, and deca-BDEs—because it will help accomplish all of these goals."
- "The elimination of deca-BDE will not compromise fire safety, but we believe it will be a step in the right direction for improving the health and safety of our firefighters."

Source: Memorandum from Eddy Crews, Associated Fire Fighters of Illinois, and Margaret Vaughn, Illinois Fire Fighters Association, to the Members of the Illinois Legislature, March 20, 2007.

MAINE

Professional Firefighters of Maine

 "If passed, the law would see these bromide based chemicals, commonly referred to as DECA, phased out and replaced with phosphorus-based retardants that provide fire prevention capabilities comparable to bromides but have none of the negative health dangers associated with DECA."

Source: Press release issued by the Professional Firefighters of Maine, April 10, 2007.

Portland Fire Fighter, Bobby Reynolds Professional Fire Fighters of Maine

 "Maine's firefighting community stands with one voice in support of [restricting deca-BDE].
 With safer alternatives readily available that meet the same fire safety standards, phasing out deca should be a no-brainer."

Source: Bobby Reynolds in phone communication with Matt Prindiville, Natural Resources Council of Maine, April 3, 2007.

MARYLAND

Baltimore Fire Chief James Clack

 "There are plenty of alternative nontoxic flame retardants available today, and some manufacturers have voluntarily switched to using them. Firefighters face risks every day, even without the added health threats posed by the use of unnecessary toxic chemicals in products we all use in our homes." Source: Letter from James Clack, Baltimore Fire Chief, printed in the Baltimore Sun, April 9, 2009.

MINNESOTA

Minnesota Professional Fire Fighters

 "While flame retardants in general save lives and property, the continued use of deca is unnecessary, as safer alternatives that don't persist and accumulate in the environment and in the human body are available. As professional fire fighters we support effective fire safety standards and are convinced that phasing out the use of deca will not compromise fire safety in any way."

Source: Memorandum from Tom Thornberg, President, Minnesota Professional Fire Fighters, to the Members of the Minnesota State Legislature, January 2008.

NEW YORK

Firemen's Association of the State of New York (FASNY)

 "We are concerned with providing the safest working environment for these [first] responders and the need to maintain the highest safety standards; a big step toward achieving these goals can be made by banning the use of polybrominated diphenyl ethers (PBDEs)."

Source: Memorandum from the Firemen's Association of the State of New York in Support of A7977 and S5244 to restrict the use of deca-BDE, June 20, 2007.

WASHINGTON

Washington State Council of Fire Fighters Washington Fire Chiefs Washington State Fire Fighters' Association

 "Providing the safest working environment for firefighters, and the need to maintain the highest safety standards are of the utmost concern; it is clear that we can achieve both of these goals by banning the use of PBDEs."

Source: Letter from Keven E. Rojecki, Legislative Liaison, Washington State Council of Fire Fighters; Mike Brown, Executive Director, Washington Fire Chiefs; and T.J. Nedrow, Washington State Fire Fighters' Association, March 27, 2007.

Washington State Council of Fire Fighters

 "Many studies involving firefighters exposed to these and other toxic gases during active firefighting, overhaul, and long-term exposure from these chemicals penetrating protective gear have found that fire fighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases. While we clearly support the use of flame retardant chemicals, there are alternatives already in use that do not contain bromine or chlorine and are much safer for firefighters than PBDEs."

Source: Memorandum from Keven E. Rojecki, Legislative Liaison, Washington State Council of Fire Fighters, to the Members of the Washington Legislature, February 9, 2007.

VERMONT

Professional Fire Fighters of Vermont

- "Banning Deca will not affect fire safety."
- "Vermont needs fire safety without toxic chemicals."

Source: Burlington Free Press, February 18, 2009, quoting Matt Vinci, President, Professional Fire Fighters of Vermont.

MICHIGAN LEGISLATORS CAN PROTECT CHILDREN, FIRE FIGHTERS AND OUR GREAT LAKES FROM DECA-BDE!

Support HB 4699 to phase out deca-BDE in mattresses, residential furniture, televisions, and computers.

Network Members:

American Academy of Pediatrics (Michigan Chapter) • Arab Community Center for Economic and Social Services (ACCESS) • Association for Children's Mental Health • Autism Society of Michigan • Citizens for Alternatives to Chemical Contamination • Clean Water Fund • Clinton County Family Resource Center • Detroiters Working for Environmental Justice • East Michigan Environmental Action Council • Ecology Center • Healthy Homes Coalition of West Michigan • Learning Disabilities Association (LDA) of Michigan • LocalMotionGreen • Michigan Chapter of the National Association of Pediatric Nurse Practitioners • Michigan Coalition for Children and Families • Michigan Environmental Council • Michigan League of Conservation Voters Education Fund • Michigan Nurses Association • Science and Environmental Health Network • Voices for Earth Justice.

The Michigan Network for Children's Environmental Health is a coalition of health professionals, health-affected groups, environmental organizations, and others dedicated to a safe and less toxic world for Michigan's children. Through education, outreach, and advocacy, we seek to protect Michigan's children from adverse impacts caused by exposure to widespread hazardous chemicals.

For more information, contact Gen Howe, MPH, Environmental Health Campaign Director, at 734-761-3186 ext. 115 or Mike Shriberg, Ph.D., Policy Director, at 734-761-3186 ext. 108.

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May 29, 2009

Representative Deb Kennedy State of Michigan S 0787 House Office Building P.O. Box 30014 Lansing, MI 48909-7514

Dear Representative Kennedy:

The Executive Board of the Michigan Association of Fire Chiefs has passed a resolution supporting House Bill 4699, a bill banning DECA-BDE.

We support this bill for the following reasons:

- DECA-BDE and its family of flame retardant chemicals known as polybrominated diphenyl ether (PBDE) have been identified as having adverse physiological and developmental impact on humans.
- There are readily available substitute products that do not exhibit these
 effects. A number of large manufacturers have voluntarily stopped using
 PBDE chemicals and are using alternative flame retardants.
- When PBDE compounds are exposed to fire they burn and release dense fumes and a highly corrosive gas known as hydrogen bromide which expose firefighters to additional chemical hazards.

We would welcome the opportunity to testify in support of HB 4699 when a hearing is scheduled in the House Great Lakes and Environment Committee. Until then, please contact me if you require further information or have any questions.

Sincerely.

David Peterson

President



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Herman Miller among those leading way in phasing out chemical

By HYONHEE SHIN Capital News Service

Posted Dec 07, 2009 @ 07.00 AM

Lansing, MI — Have you ever worried that flame-retardant chemicals in computers or furniture might be hazardous to your health?

A Brownstown lawmaker does worry and wants Michigan to phase out the use of one such chemical, deca-BDE. Deca-BDE is used in electronics and home furnishings to make them difficult to burn.

Soil scientists say deca-BDE and two related fire retardants are considered toxic, persistent and bioaccumulative. They build up in fish and water and can harm the human body and breast milk, as well as water quality.

In 2004, the Legislature banned manufacturing and distributing materials containing more than 0.1 percent of two other flame retardants. However, deca-BDE is still widely used and could degrade into toxic forms, under certain circumstances, studies show.

A bill by Democratic Rep. Deb Kennedy aims to phase out deca-BDE in televisions, computers, mattresses and residential furniture upholstery by Jan. 1, 2012,

"My motivation is to protect public health and keep lakes as clean as possible," she said. "Deca-BDE is found in every Great Lakes fish we eat because of bioaccumulation "

The Michigan Chemistry Council has opposed banning deca-BDE. It said existing alternatives to deca-BDE work well on textiles but not as well on plastics.

But Mike Shriberg, policy director of the Ecology Center and the Michigan Network for Children's Environmental Health in Ann Arbor, said there's no need to use deca-BDF.

"Exposure to deca-BDE from these products, such as mattresses and furniture, leaches out through the products directly or via dust into people's bodies and other pathways," he said.

Shriberg said the level of accumulation in the Great Lakes is a particular concern because deca-BDE is similar to PCBs, polychlorinated biphenyls, which are chemicals banned in the 1970s because of their high toxicity.

The Michigan Network, a coalition of organizations including the Michigan Nurses Association, Learning Disabilities Association, Michigan chapter of the American Academy of Pediatrics, said toxic levels of deca-BDE and the two related flame retardants are at all-time high.

A 2008 study by the Michigan Interdepartmental Toxics Steering Group shows chemical levels in human tissues in North America have significantly increased over time and are much higher than levels in Europe or Japan.

Professor Richard Rediske, a water resources expert at Grand Valley State University's Annis Water Resources Institute, said deca-BDE should be banned.

"It's accumulating in humans by breathing dust," said Rediske. "The dust falls on food, feed and plant materials which in turn are consumed by animals and move up the food chain. Also in laboratory experiments, deca-BDE mimics thyroid hormones and may produce developmental-related problems."

A co-sponsor of Kennedy's bill, Rep. Jimmy Womack, D-Detroit, participated this year in a biomonitoring project by Physicians for Social Responsibility. The organization's testing found a high level of deca-BDE, mercury and other potentially toxic substances in his blood. Womack said, "Those chemicals can bring harm to you and your family. As a consequence of that study, I was able to be more empathetic to the need for us to do due diligence when it comes to protection of the public."

Kennedy said firefighters face the most serious risk.

David Peterson, president of the Michigan Association of Fire Chiefs and the fire chief in Plainfield Township, said his organization supports her proposal.

"When these compounds are exposed to fire, they burn and release dense fumes and a highly corrosive gas, hydrogen bromide, which expose firefighters to additional chemical hazards," he said.

The International Association of Fire Fighters also supports the ban.

"Many studies involving firefighters exposed to toxic gases during active firefighting, overhaul and long term exposure from these chemicals penetrating gear, have found that firefighters have a much greater risk of contracting cancer, heart and lung disease and other debilitating diseases," the organization said in a statement.

Fire retardant alternatives to deca-BDE are available, experts say.

And Rediske, at Grand Valley State, said other action also is needed.

"We need to focus more on technology to limit their use, such as electronics that run cooler so we can get lower energy consumption as a secondary benefit," he said.

Kennedy said a number of leading manufacturers no longer use deca-BDE, including the two largest furniture companies in the state — Herman Miller Inc. and Steelcase Inc. — Michigan-based La-Z-Boy Inc., 14 top U.S. bedding makers and electronic manufacturers like Apple Inc. and Dell Inc.

Some states, such as Washington and Maine, already ban deca-BDE. Similar legislation is pending in Illinois and Minnesota.

"European countries like Sweden stopped using it 30 years ago," said Kennedy. "Michigan will be one of the leaders."

Co-sponsors include Democratic Reps. Daniel Scripps of Leland; Lesia Liss of Warren; Harold Haugh of Roseville; Sarah Roberts of St. Clair Shores; Marie Donigan of Royal Oak; Vincent Gregory of Southfield; Fred Miller of Mount Clemens; Lisa Brown of West Bloomfield; Kimberly Meltzer of Clinton Township; and Mark Meadows of East Lansing.

The bill is pending in the House Great Lakes and Environment Committee.

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Great Lakes fish soak in new poison

Posted by Jeff Alexander | The Muskegon Chronicle March 08, 2008 21:32PM

Toxic flame retardants commonly used in computers, televisions and textiles have accumulated dramatically in Great Lakes fish over the past two decades, prompting legislative efforts to ban the compounds.

The state Legislature in 2004 banned two types of the flame retardants, called polybrominated diphenyl ethers, or PBDEs. Michigan was one of several states to ban the manufacture, use or distribution of penta-BDE and octa-BDE.

But a third type of the chemical, deca-BDE, is still widely used and can break down into the more toxic forms of PBDEs. Environmental activists and some scientists are pushing for a ban on deca-BDE, a persistent toxin that accumulates in the food chain.

"We're trying to head off the next PCB disaster in the Great Lakes," said Mike Shriberg, policy director for the Ann Arbor-based Ecology Center. "This chemical acts a lot like PCBs, is extremely persistent in the environment and bioaccumulates; once it's here it's very hard to get rid of it."

PCBs were a group of chemicals widely used as coolants in electrical transformers until they were banned in 1977. The chemicals, which can cause developmental problems in children and are suspected of causing cancer, are still found in some species of Great Lakes fish.

The state warns children and women of child-bearing age to limit consumption of certain fish to avoid ingesting potentially harmful amounts of PCBs.

PBDEs are believed to pose some of the same health threats as PCBs, according to scientific literature.

Though traces of PBDEs have been found in fish, wildlife and humans around the world, the levels found in Americans are much higher than those detected in residents of Europe or Japan.

Some of the world's highest concentrations of PBDEs have been found in Lake Michigan salmon, according to researchers. The concentration of PBDEs also have escalated in Great Lakes walleye and lake trout since 1980, according to scientific data compiled by government agencies and university researchers.

Currently, there are no advisories that provide consumers guidance on whether it is safe to eat Great Lakes fish containing PBDEs. The federal government lists the chemicals as possible cancer-causing agents; studies have shown the chemicals also cause reproductive problems and brain damage in rats.

Rick Rediske, a Grand Valley State University professor studying PBDEs, said the flame retardants seem to be less toxic to humans than PCBs. He said following Great Lakes fish consumption advisories based on PCBs should protect consumers. The state recommends that women and children eat no more than one meal per month of salmon or lake trout from Lake Michigan.

PBDEs were used as flame retardants in an array of consumer products, -- including computers, furniture and drapes -- until several states and nations began banning the chemicals. Nearly half of all deca-BDE produced worldwide is now used in the U.S., according to the Illinois Environmental Protection Agency.

PBDEs get into the environment as dust particles that flake off plastic products and textiles. Once airborne, the chemicals drift in the wind, often settling in the world's largest freshwater basin: the Great Lakes.

The chemicals remain in the environment for years and accumulate as they move up the food chain, from plankton to fish and people and animals who eat fish.

PBDE concentrations in Great Lakes walleye and lake trout increased exponentially from 1980 to 2000, doubling every three to four years, according to data published in the journal Environmental Science & Technology.

Rediske said he has found the chemicals in every large fish he sampled in bays along Lake Michigan. He said the state "absolutely" should ban deca-BDE.

"Everything points to the fact that PBDEs are increasing in the food chain and they are chemicals of concern in the Great Lakes," said Rediske, a water resources professor and researcher at GVSU's Water Resources Institute. "Historically, the Great Lakes collected mercury and PCBs from the atmosphere,; now they're collecting PBDEs."

A bill in the state Legislature proposes an immediate ban on the use of deca-BDE in mattresses or furniture. The bill would outlaw the use of the chemical in televisions and computers starting in 2012.

Environmental groups and the Michigan Professional Firefighters Union support the legislation. The Michigan Chemistry Council and the Michigan Association of Fire Chiefs oppose banning deca-BDE.

"Right now, we feel that the science has not justified the banning of deca-BDE," said Jerry Howell, chief executive officer of the Michigan Chemistry Council.

Howell said the three U.S. manufacturers of deca-BDE are developing alternatives to the chemical. He said existing alternatives to deca-BDE developed to date work well on textiles but not as well on plastics.

A 2007 draft state Department of Environmental Quality report recommended banning deca-BDE as soon as manufacturers develop a suitable alternative.

Maine and Washington have already banned deca-BDE and other several states are considering similar legislation.

Three of Michigan's largest furniture makers -- Steelcase, La-Z-Boy and Herman Miller -- have already replaced deca-BDE with more environmentally friendly flame retardants, Shriberg said.

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